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ABSTRACT

Exploring existing methodologies to determine whether they can be adapted or adopted to support strategic goal setting, this paper focuses on information gathering techniques as they relate to the human resource development professional's input into strategic planning processes. The information gathering techniques are all qualitative methods and include: the cultural audit; judgmental methodologies, such as life cycles and Delphi Technique; political forecasting; history/failure analysis; scenarios; portfolio analysis; cross-impact analysis; graphical methodologies, such as force field analysis, network construction, decision trees, and graphs; uncertainty-complexity analysis; and critical success factors. A section is devoted to each of these techniques. An attempt is made to evaluate the various data gathering methodologies. A graphic model of the techniques being applied to the decision-making process is included. In the model, a label of strong, moderate, or weak is attached to each technique. The conclusion states that more research must be done before it can be stated with any confidence that a given technique is best suited for a particular task or as input into a particular decision-making system. An eight-page bibliography concludes the document. (CML)

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Study Number Six

A Review of Qualitative Data Gathering Methods and Their Applications to Support Organizational Strategic Planning Processes

Phillip C. Wright
Gary D. Geroy

March 1988

Institute for Research in Training and Development

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INTRODUCTION

It has long been known that "most people have a tendency to stabilize the world around them" (Whitfield, 1975) as they attempt to cope with the ever increasing volume of stimuli that bombards us from all quarters. Unfortunately, our world, characterized by increased competition and shortened product life cycles, is becoming even less amenable to rational analysis (Emerson, 1985; Opalka and Williams, 1987).

Managers hardly can be blamed, then, if they tend to view the planning function as a complicated process that tries to extrapolate present reality into the fuzzy and intimidating future. Indeed, many smaller firms avoid the strategic planning process entirely by projecting operating plans into a future time frame and calling the result a strategic plan (Smith, 1979). It is evident, too, that the rationale for planning is often misunderstood and, mistakenly, failure is usually seen as a function of inadequate implementation; when in reality, poor planning stems from "a general lack of political foresight [and] historical hindsight" (Ramanujam and Venkatraman, 1985). In essence, then, strategic planning should be designed to create a conceptual framework that will enable management to predict turning points by fostering an understanding of the causal factors that influence future business environments (Naylor, 1980; Emerson, 1985; Capon and Hulbert, 1985; Ramanujam and Venkatraman, 1985).

The backbone of this process is the collection and the presentation of appropriate data. Those involved in the development of the human resource have an important role to play as every change or shift in the environment, whether internal or external, will have ramifications for people. Indeed, if a proactive approach is taken, assurance of planned availability of appropriate human resources and skill may be a determining factor in final strategic decisions.

The role of the human resource development (HRD) professional has been described best by Sweet (1981). As Figure 1 indicates, there are two prime thrusts to the strategic planning process--the tactical/activity function and the manpower

development function. Both of these facts are linked, for change in one affects the other. It is in the "manpower development" area that the HRD professional will be most active, although it will be shown that his/her focus indeed can be much broader, as the manpower development/strategic planning relationship is symbiotic.

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insert Figure 1 about here

This paper will focus on appropriate information gathering techniques as they relate to the HRD professional's input into strategic planning processes. Thus, no attempt will be made to discuss planning per se, but rather to explore existing methodologies to determine if they can be adapted or adopted to support the strategic goal setting function.

As indicated previously, there appears to be some long standing concern among many managers about the relevance of planning (Schaffer, 1978; Chakraborty and David, 1979). It is suggested that if planning is based on information that is gathered and presented in a manner that managers can understand, they are more likely to act upon it (Nisbett and Ross, 1980). For this reason, qualitative rather than quantitative techniques will be stressed, as it will be argued that statistical analyses are not well understood or trusted. Further, attempts will be made to isolate and analyze factors that are not amenable to numerate analysis, yet can be useful in building the gestalt on which the strategic planner must act.

Within the context of this paper, then, the term "qualitative technique" is defined as information gathering that is not based upon numerical data, relying instead on methods that use or combine phenomena such as experience, judgment and intuition (Barron and Targett, 1985). This definition is not meant to suggest that numbers will never be used, rather the precepts which provide focus for our discussions will be distinctly non-quantifiable. As well, throughout the paper, it may be found

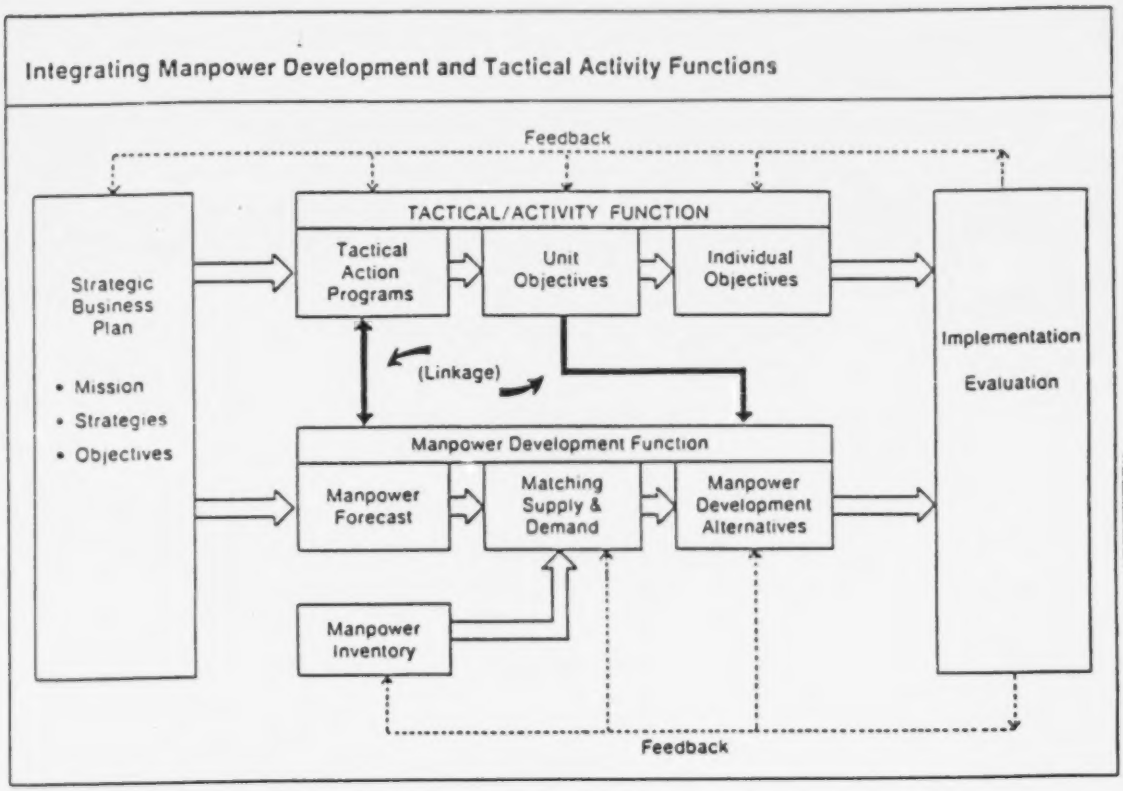

Figure 1. Integrating Manpower Development and Tactical Activity Functions

Source: Adapted from Sweet (1981).

that the various concepts tend to blend together, each drawing upon ideas and methods common to a number of techniques. The structure of this paper, then, is but one attempt to order a diffuse body of information. There well may be other ways in which qualitative data gathering methodologies can be classified.

Rationale

Having made the decision to concentrate on the qualitative aspects of data collection, it would be useful to sample literature concerned with psychology, forecasting and business strategy to determine if such a stance can be defended. Justification for the use of qualitative methodologies can be found in two spheres, the lack of utilization of quantitative techniques, attitudes, and analytical skills and abilities of managers. It has been suggested by Sims and Eden (1984) that:

> By their very nature, highly mathematical, statistical, or computer based methods constrain the possibility of using creatively the subjective ideas and theories a group of people have gained from their individual experience of being a part of the world which is being considered. (p. 51)

Sims and Eden postulate further, that systems dominated by numerical data reduce the chance that a "collective unconscious" will surface and that "idiosyncratic and subjective images of the world" will not be released (p. 51). This work is supported by Leidecker and Bruno (1984) who argue that temporal and intuitive factors sometimes uncover "subtleties" that would otherwise be overlooked (p. 29).

In the realm of accuracy, Oller (1985) has indicated that it might be unwise to rely on forecasts of business activity that predict more than three years in advance. Similarly, Rowe, Mason and Dickel (1986) have examined the most commonly used statistical methods--multiple regression, exponential smoothing, and term series analysis. In that these methodologies are based on the theory that future events can be forecasted by using "regularities" discovered about the past, they tend to be unreliable, particularly in an era of rapid change. Continuing on, they suggest that "if

management cannot forecast critical events in the environment, then strategies that can cope with unknown new conditions are needed" (p. 165). This paper will delineate data gathering techniques that may lead to the development of such strategies.

The second main reason for the use of qualitative methodologies is related to what Schriefer (1982) calls "management's confidence gap," as executives have no interest in 'computerese' (Thomas and Schwenk, 1983), but want to know what has been done to help solve business problems (Schrieber, p. 141). This attitude may stem from Naylor's (1983) comment that many models designed by planning experts are "little more than. . . number-crunchers," some with more than 1,000 equations (p. 113).

Faced with this mind-numbing complexity, managers tend either to ignore the technique or to accept the results unquestioningly (Chatfield, 1986; Lenz and Lyles, 1985). The story is told of a forecasting group that produced quarterly reports for a large company. The normal technique utilized a multi-variate "package." One quarter, just before the report was due, the computer went down. The data, therefore, were "guesstimated. . . by hand." No one noticed!! (Chatfield, 1986, p. 402). Similarly, "unqualified acceptance can lead to the misapplication of models and "excessive rationality" (Lenz and Lyles, p. 67). In the words of James (1972):

> Quantification destroys the ideological cohesion of experience and knowledge turns into a perversely empty thing; and it soon becomes impossible to determine which scientist is doing something significant and which something trivial.

When this lack of confidence is coupled with the fact that many models don't work (Jenkins, 1982), it is not surprising to find that less than half of even the largest companies in the world use statistical modeling, even occasionally (Klein and Linneman, 1981). Lest it be thought that Klein and Linneman's study is dated and, therefore, unreliable; more recent work by Sparkes and McHugh (1984) tends to support their finding. Sparkes and McHugh suggest that the more sophisticated the

technique, the less it will be used. Indeed, subjective methodologies--executives' assessments, surveys, cross-impact analysis, Delphi method--were used as often or slightly more often than trend analysis, moving averages, simulation and the like (p. 39). Neither did time-scale of forecast have a great affect on the technique used, although, statistical methods tended to be slightly more dominate for medium- and long-term forecasting (p. 40).

It has long been known that "probative but dull statistics" have little effect on inferences (Nisbett and Ross, 1980, p. 58). If an organization or culture is not ready to accept a technique, it is fruitless to use it (Day, 1982). No matter how efficient the system is in gathering data, if it does not take human needs into account, it will not be used (Riggs, Monfort, 1984; Telgen, 1985) or worse, it will be subverted (Wright, 1988).

These observations have been borne out by the experiences of the majority of managers interviewed during this study. With notable exceptions, managers did not trust quantitatively based information, because they do not understand the premises on which the data base was built. Just as none of the many best selling business-related books sold in this decade have been written in "academic jargon" or needed an in-depth understanding of statistics to comprehend (Fulmer, 1986), so too must those involved in strategic formulation gather and present information in a qualitative format. Otherwise . . . the gatherer will have little effect on those he/she seeks to influence.

While this state of affairs may be deplored by academicians, who tend to emphasize "the analysis of a particular collection of truths without sorting out what has practical potential" (Fulmer, 1986), reality must be served. Perceived relevance must be respected; even though the use of quantitative methodologies clearly may be justified in numerous situations, if the client is not ready to accept them, then efforts in that direction will go unrewarded. As managers appear determined to use qualitative data gathering methods, then, this paper will attempt to facilitate their use and to make suggestions as to where various techniques might prove beneficial.

Weaknesses

In spite of this obvious enthusiasm for the qualitative aspects of data gathering, users would be wise to note that criticism is widespread. Many qualitative methods are based on asking questions of experts (Barron and Targett, 1985), where question format may have an adverse affect on accuracy. Similarly, Geurts and Kelly (1986) found that even though the judgmental technique is used most often by retail and department store buyers, time series and econometric methodologies are more accurate, unless there is an "unusual event like a promotion" that is almost certain to influence sales (p. 263).

Adelman (1984) too, in his discussion of simulation models, indicates that ". . . unaided, people use simple decision-making heuristics that typically violate decision-theoretic axioms and often result in suboptimal decision making" (p. 81), an argument supported strongly by Nisbett and Ross (1980). This lack of a "solid conceptual or theoretical framework" has as well, been deplored by Naylor (1983) as part of an analysis involving portfolio models (p. 113).

Perhaps it would be worthwhile to quote Barron and Targett (1985) in ending this section:

> The lesson must be that the sophistication of the techniques will only be worthwhile if the forecaster gets the basics right first. This is especially true in qualitative forecasting. (p. 30)

NATURE OF THE STRATEGIC PLANNING PROCESS

While it is not the main aim of this paper to discuss the theory of strategic planning, data gathered in support of this process must be of use, or the trainer's efforts may prove ineffective. It would be wise, therefore, to discuss briefly the process of strategic thinking, to ensure that the methodologies presented below can be integrated into the managerial decision making process.

The formation of strategy can involve three methods of thinking:

1. assessment - including classification and modeling of the situation,
2. problem identification and analysis - encompassing goal formation and strategy design,
3. synthesis - involving inferences about assumptions, dialectical analysis and reforming.

Each of these techniques provides management with another method for coping with uncertainty. When goals and/or correct remedial activities are certain, then either problem analysis or synthesis is appropriate. Ambiguity is faced best through problem identification, while "assessment is a style adapted to ambiguity about both objectives and corrective action" (Weber, 1984, p. 60).

It is important for trainers to gather and to present information so that it does not cross the "perceptual boundaries within which many managers operate" (Hussey, 1984, p. 46). Allio (1984) suggests there are five levels of strategic evaluation--innocents, primitives, mechanics, progressives and pioneers. While it is not within the purpose of this paper to describe each stage in detail, the trainer would be wise understand the limitations or boundaries of management thought within his/her organization. Data then can be structured to appeal to management's view of reality. Indeed, the "pattern of resource allocation that produces a set of results" (Allio, 1984) must be nudged and influenced rather then prodded, or the trainer may be shut out of this critical decision making process.

The actual stages in a strategic planning process can be found in any basic text. They will not be repeated here. In essence, the steps involve the analysis/assessment of a complex set of technological, social, political and economic climates (Leidecker and Bruno, 1984) both internal and external, within the context of an overall

philosophy or driving force (Markus, 1981). If decisions affecting the trainer are to be made using such data, then information gathering methodologies must revolve around these topics.

The Cultural Audit

It has been stated that strategic decisions are made within the context of an overall philosophy or driving force (Sweet, 1981; Markus, 1981). From this realization, it is but a short conceptual step to the notion that all information is gathered and interpreted in the light of a corporate or organizational culture.

The ability then, to understand, to audit and to create reasonably accurate cultural profiles is regarded as the first step in any data accumulation process. Although sometimes criticized as an 'pseudo-science' (Wright, 1988), as an information collecting exercise, cultural profiling can be useful to the trainer for two reasons. First, the identification of systems of beliefs and knowledge as to what beliefs receive casual endorsements and which ones stem from deep and emotional conviction (Fry and Killing, 1986) is a preliminary step in selecting data and designing search strategies. As well, cultural profiling has been regarded as a prerequisite for needs analysis (Wright, 1986); the basic activity through which the trainer acquires information.

Hagedorn (1984), in his seminal paper in across the board, suggests that:

> Culture in particular companies is easy to describe, if you know what you are looking for and how to find it. The systematic approach is a cultural profile, which begins with a little detective work but consists mainly of asking a sample of experts (people who live and work in the culture and know it well) to answer a set of open-ended questions; a skilled profiler than interprets the responses. (pp. 26-27)

A primary resource in this exercise is the "prudent warrior," one who has survived many years within an organization under study. Hagedorn claims that after experience in more than 100 companies, he "usually" has managed to identify this

individual or individuals and to develop a "candid statement. . . of what a company stands for and what it can't stand" (p. 27).

Cultural profiling, as proposed by Hagedorn, is akin to socio-political monitoring (Smith, Myers, Doutt, & Valli, 1979). Although this work is somewhat dated, the important point is made that maximum effectiveness (in an overall business sense) is reached not by merely gathering information, but by "cultivating an awareness of important environmental [or cultural] trends" (p. 4).

It is in this arena that the HRD professional can have direct input into the strategic decision making process. Where is the present cultural reality leading the organization and what are the human resource ramifications? What problems appear to stem from our present cultural outlook? Are they worth worrying about? If present trends continue, what will the organization be like five years from now? In view of this cultural forecast, would management rather be proactive or reactive? Should the organization be looking at other models (Fombrun, 1982; Cunningham, 1983)? Why should people want to work here anyway (Wright, 1987)? This type of information, inserted in an acceptable format into the strategy development activity, potentially can make a major contribution to company direction and operating philosophy.

Personal experience suggests, however, that care must be taken in the collection and information dissemination phases. The HRD professional is himself/herself a part of the culture being profiled. Objectivity, then, may be difficult to achieve. As well, the trainer must be politically astute so as not to alienate important and powerful "players" or decision makers. It is for these reasons that culture often is audited by an outsider, who does not have to live with the "waves" created by a frank analysis.

Nevertheless, cultural profiling has the potential to become a powerful qualitative data gathering tool. Virtually every technique that follows is dependent upon or affected by the organization's sociological structure in some way. Without a

realistic idea as to the organization's internal makeup, the entire strategic planning process can become hopelessly skewed. Important issues such as customer service, quality control, employee mobility, promotability, turnover, corporate morality and ethics, ease of staffing and public perceptions all are related to corporate culture. In a very real sense, then, an organization's cultural makeup determines what can and cannot be done, both now and in the future. In other words, assessment, problem identification, analysis and synthesis are but activities performed within constraints dictated by cultural characteristics.

Judgmental Methodologies

For some time, it has been recognized that when a "never-before encountered environmental issue is found," planners and forecasters are left in a technical lurch" (Klein and Linneman, 1981, p. 7), but people possess special knowledge, experience and information not adaptable to quantitative manipulation (Makredakis, 1986). Thus, judgmental methods of preparing data have remained popular. Called by various titles - consensus (Taylor, 1984); speculative/conjectual (Klein and Linneman, 1981); visionary (Barron and Targett, 1984); "genius" forecasting or intuitive (Lanford, 1972) - judgmental methods rely on the knowledge and perceptions of "experts," who may or may not consult each other.

There are several methods. Tripartite techniques combine the knowledge of employees at various levels (Taylor, 1984) while Barron and Targett describe methodologies whereby different criteria are given subjective weights that compare each criterion in relative terms to all others (p. 26). Finally, Sweet (1982) used knowledge/judgment of first-line managers as a primary input into his manpower forecasting model, and managerial assessment of advancement potential as a major factor in the manpower data bank (See Figures 2 and 3).

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about here

A. Life Cycles

Another common judgmental method used by HRD professional is the life cycle approach. One small multi-national company in Toronto, Canada utilized a system whereby the president and the senior vice-president allocated approximately two days per year to discuss and place key people on a career curve (Figure 4).

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insert Figure 4 about here

From these data, strategic decisions could be made concerning long-range movement and/or development of senior personnel (Sweet, 1982). This technique long has been used for product forecasting (Fry and Killing, 1986; Below, Morrisey, Acomb, 1987). The difficult area of management self-renewal also requires a strategic approach (Sawyer, 1986), therefore, the analysis of life cycle curves seems particularly appropriate in this instance.

B. Delphi

When the HRD professional must operate within complex, nonlinear environments, Delphi or 'Delphi-like' processes may be useful (Eschenbach and Geitauts, 1985) for both data gathering and policy formation. As detailed descriptions on the design and administration of this technique are available from many sources (Lanford, 1972; Barron and Targett, 1985; McNomee, 1985), the short definition penned by Eschenbach and Geistauts (1985) will suffice:

> The key elements of Delphi are anonymity of predictions, repeated iterations, and feedback. Responding to a series of questionnaires, a panel

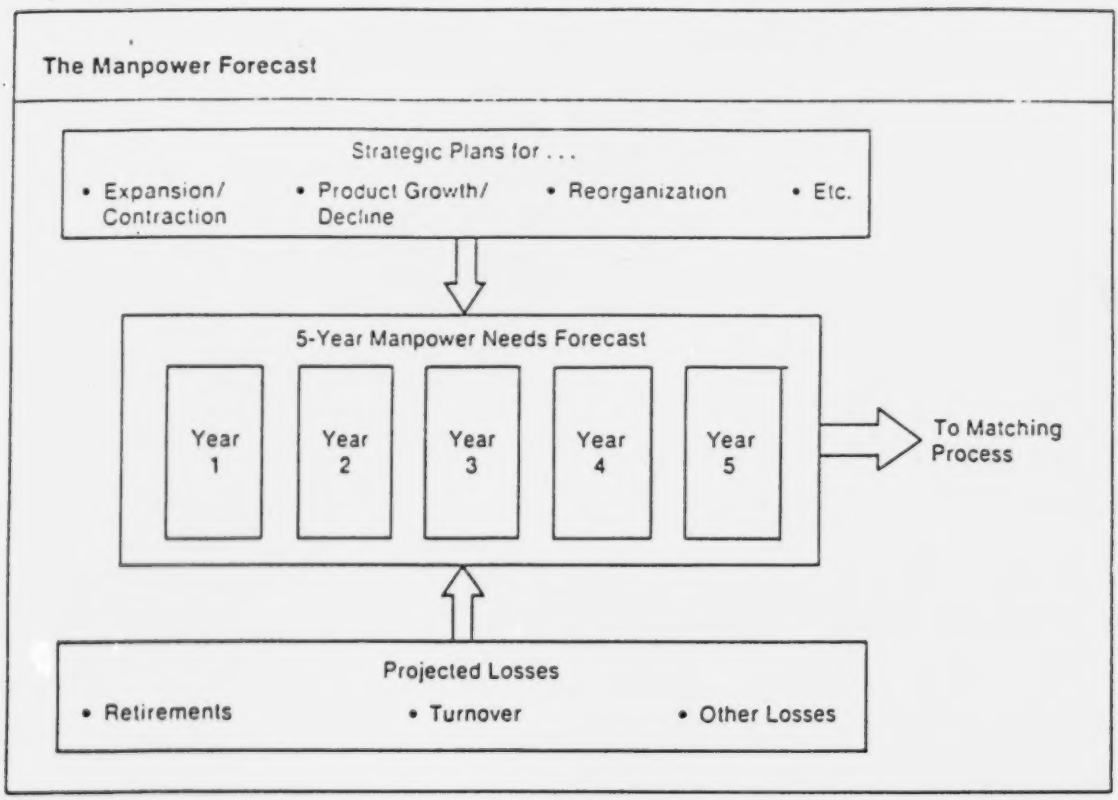

Figure 2. The Manpower Forecast

Source: Adapted from Sweet (1981).

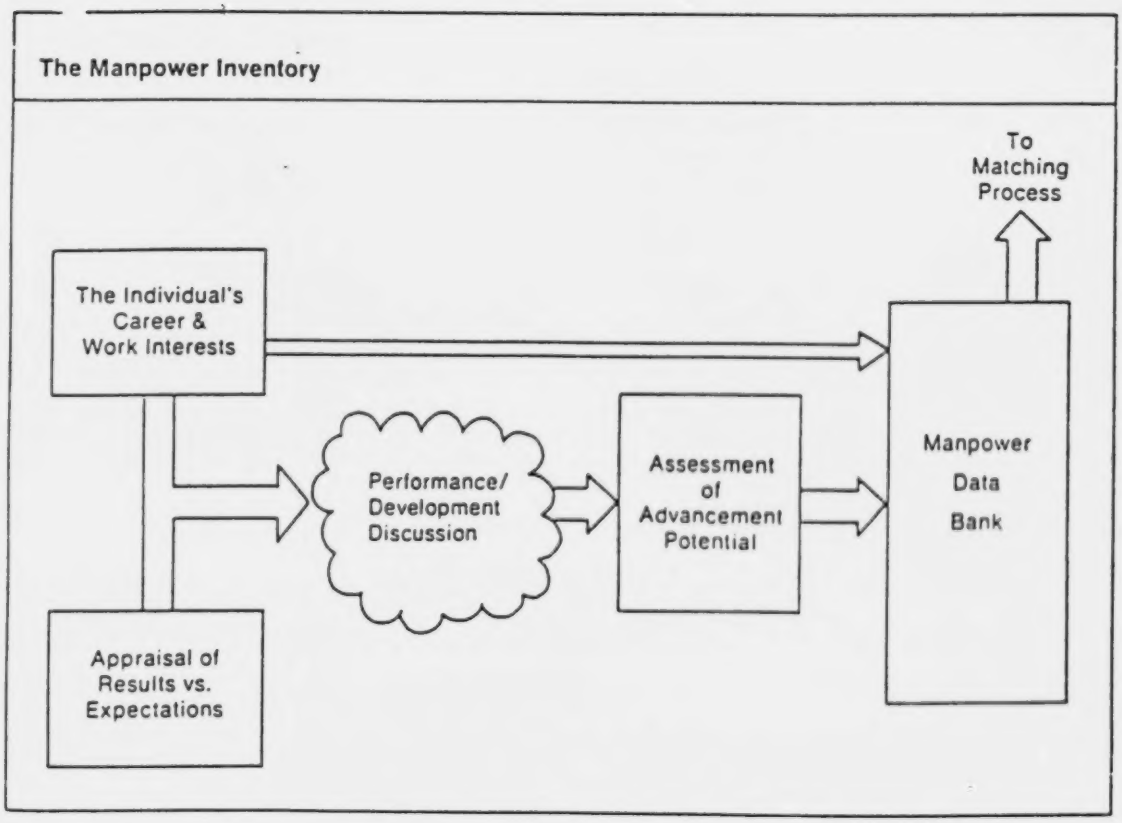

Figure 3. The Manpower Inventory

Source: Adapted from Sweet (1981).

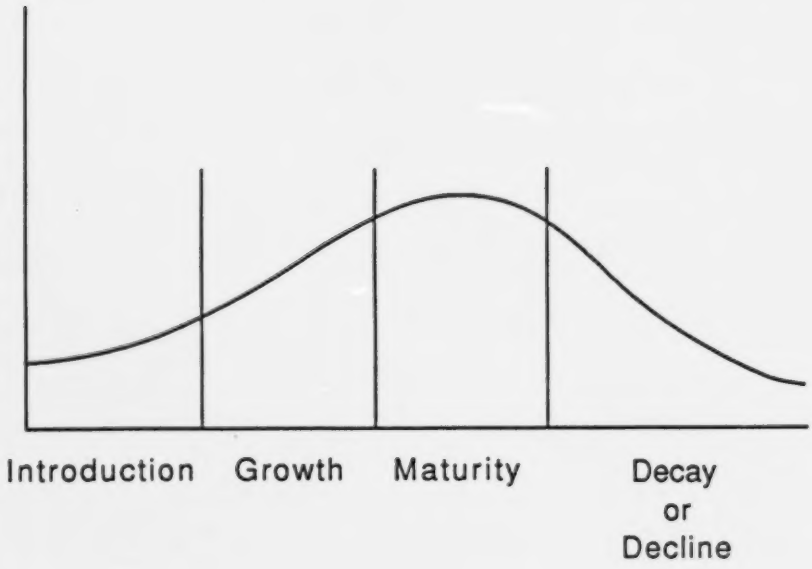

Figure 4. The Career Curve

Source: Sweet (1984)

> of experts forecasts event dates or probabilities. Answers to each questionnaire round are summarized by the study team and incorporated into the next questionnaire, but panelists are not told who is responsible for a particular prediction. Panelists then evaluate and possibly modify their predictions, explaining the basis of any major differences between their position and the group consensus [Linstone and Turoff, 1975]. Many variations of this generic Delphi process exist. . . .(p. 103)

These variations can range from brainstorming (Mason, Mitroff and Barabba, 1980; Barron and Targett, 1985) to fully refined Delphi analyses.

Delphi techniques have been criticized for unreliability and for producing self-fulfilling prophecies. In addition, it has been noted that question format potentially can influence responses making it "difficult to access and utilize the expertise of the panel" (Lanford, 1972). The Rand Corporation, however, has "validated its use" and although Delphi is not scientifically rigorous, "it has gained considerable currency as an aid to good managerial decision making in the United States" (McNomee, 1985, p. 243).

Despite criticism by Makredakis (1986), Geurts and Kelly (1986) and many others, managers continue to be comfortable with judgmental methodologies. In fact, it is suggested that research done in the 1960's by Morris (1967), may still be valid, as one of his conclusions was that managers find "intuition" to be a satisfying manner in which to make business decisions. It should be stressed, however, that provided the culture will accept them and if conditions are reasonably static, or if a long-term outlook is required, consideration should be given to checking judgmental data by quantitative means, as humans appear to be overly optimistic in estimating future uncertainty (Makredakis, 1986).

Political Forecasting

HRD professionals live within complex political environments, both internal and external. The ability to gather and to synthesize political data is crucial to understanding corporate culture and long-range technical change issues. In addition,

any information received by management will be filtered through a political context. What is regarded as "valid" may be less a function of rational argument and presentation, then finding the right "fit" that will allow data to merge into the political climate.

When acquiring information about political realities and probable future events, it is best to use qualitative methodologies, as the simplifications necessary for quantitative analysis ignore the nuances and complex socio/cultural interplay that characterizes political activities (Ascher, 1982). At the macro level, techniques include political mapping, a process that creates a 'political map' of the major forces--organizations, groups, individuals--that might influence an industry, company or technical innovation. Another approach is to delineate informal political networks that might prove useful when searching for individuals who might support or oppose an organization's interests (Taylor and Hussey, 1982). Finally, the challenge of integrating or linking these macro-level forces into the micro-level world of policy formation, must be addressed (Austin and Yoffie, 1984).

While the HRD professional may or may not be involved in these macro-level processes, as his/her expertise rests most securely in predicting the human ramifications of political activity, at the micro or internal level, socio/political analysis is an extremely useful activity. In many organizations, the human resource development function still is regarded with skepticism and even where it is not, training initiatives, quite rightly may have to be "sold" to management. Ideologies, for example, those people with a "single-minded viewpoint" (Coplin and O'Leary, 1983, p. 30) still must be faced, in that their conclusions often stem from a deeply-rooted dislike for some group or activity (p. 31).

The successful HRD professional knows where potential pitfalls and allies are likely to be found. Macro-level data gathering activity, then, can be repeated on a

smaller scale, enabling trainers to "see" the political ramifications of their work, thus increasing the likelihood that inputs aimed at influencing strategy will be accepted.

History/Failure Analysis

There are some aspects of organizational culture and policy that only may be attributed to historical events. To truly understand why an organization operates in a certain manner, perhaps it would be wise to study and compare the role of successive chief executives. These, and other similar factors are of use in the design of management training and as an input into the planning process (Tauber, 1983).

Although there are "varying interpretations" of how history can contribute to planning, over 200 North American corporations have in-house archives. Companies that have used historical data include Chase Manhattan, Coca-Cola, Weyerhaeuser, the Guardian, AT&T, Wells Fargo, Citibank and General Electric (Tauber, 1983).

In addition to one's own history, attention should be paid to the history of others, especially to those who have not been successful. Here, one can learn what pitfalls to avoid in preparing data for use in planning systems. Hussey's (1984) discussion of the Boston Consulting Group's report on the demise of Britain's motorcycle industry for example, reveals that the concern for short-term profitability was paramount in this sector's downfall. Similarly, Gross (1987) outlines ten reasons why International Harvester went into liquidation.

The HRD professional should not be adverse to learning from the mistakes of others. The tools of the historian, objectivity, critical analysis and the synthesis of widely-varied data (which may involve quantitative techniques) into meaningful wholes, can be used to chart change through time and to "point out where alternative responses might have been possible" (Tauber, 1983, p. 15). The planning function, therefore, while oriented to the future, is rooted in the past, as the examination of "background issues" can support arguments for change and aid in the definition of issues that require attention (Emerson, 1985, p. 30).

Scenarios

The essence of using scenarios as a planning tool, is to answer the question: Given a certain set of conditions, what will happen to our enterprise (Taylor, 1982)? This technique seems ready-made for the HRD professional, in that it should be possible to depict how human resources will be affected by any number of plots based on present conditions and depicting likely activities within any given sequence (Lanford, 1972).

In practical terms, scenarios can be developed out of a series of five steps:

1. the development of a data base,
2. the development of an organizational strategic profile,
3. the development of an environmental strategic profile,
4. the testing of the potential impact of environmental factors upon organizational characteristics,
5. in-depth analysis of important environmental and organizational characteristics isolated in the preliminary scenarios (McNomee, 1985).

Good scenarios, then, are not merely daydreams of possible futures, but a kind of 'reversed history' based on carefully researched facts and assumptions "that have been compared with the past and extrapolated into the future (Rowe, Mason and Dickel, 1986, p. 166).

Sometimes called "future mapping" (Mason and Wilson, 1987), scenario-like processes have been used in the development of mission statements (p. 21). Similarly, Exxon Corporation, faced with an uncertain future, has developed a series of "futures" to provide guidance for long-term investment and to study the corporation's "vulnerability" in a long period of low oil prices (Rowl, 1987).

One manner in which the HRD professional can handle the scenario development process, is to build a "no-change scenario" consisting of a forecast that assumes no

``change in present strategies. This type of input can expose inconsistencies in present thinking and afford management the chance to take remedial action (Fry and Killing, 1986).

Another aspect of this process not often discussed, is the possibility of creating one's own environment (Rowe, Mason, and Dickel, 1986). Should a given scenario appeal to management above all others, perhaps management can take a proactive approach and attempt to manipulate events to the firm's advantage. The HRD professional can be especially active in this procedure, as this sort of strategic decision making rarely can take place without reference to the human resource.

Finally, it seems reasonable that scenarios can be used at both the macro- and the micro-levels. Plans at all levels can be rendered obsolete by the unforeseen. A scenario or "end state" approach can give management a range of possibilities, depicting the "stream of events that lead to any given 'state'" (Mason and Wilson, 1987), thus increasing the effectiveness of decision making processes affecting both internal and external environments.

Data gathering through scenario development may be most useful in companies with high levels of capital input and long product development lead times. Oil, mining and chemical companies, for example, seem to favor this approach, while industries with shorter product cycles and fewer capital demands--home video rentals and small-scale builders--feel little need to develop scenarios (McNomee, 1985).

Despite obvious acceptance in some circles, scenario building has been criticized for being 'a practice without a discipline' (Taylor, 1982). In some instances, an excessive number of possible futures makes data manipulation unwieldy (Sloan, 1981) and failure to make a step-by-step analysis of all possible futures in terms of each functional area - economics, sociological, political, technological - can make the process ineffective (Lanford, 1972).

Perhaps the greatest problem with the technique, however, is obtaining commitment from management. "Weaning" managers from their dependence on traditional forecasting techniques "to the more free thinking qualitative methodologies of scenario planning is an extremely difficult task" (McNomee, 1985, p. 233). Even in a sophisticated organization like Shell, it took almost eight years to convince management of the benefits arising from the scenario building approach (Zenter, 1982).

Portfolio Analysis

More than a decade ago, the General Electric Company adopted the concept of SBU's, thus introducing portfolio analysis to organizational strategists (Naylor, 1983). Using this approach, products are categorized into four--stars, dogs, cash cows and problem children. These titles are reasonably explanatory.

-- Stars are products with high market shares that generate considerable amounts of money,

-- Dogs exhibit the twin characteristics of low market share and low profits,

-- Problem children are products sold in a high-growth market, but have low market share,

-- Cash cows are situated in low-growth markets, where they enjoy considerable market share, thus, generating excess monies to be used elsewhere (McNomee, 1985) (Figure 5).

From this analysis, cash flow or support can be planned as resources are shifted to areas where, potentially, they will be most productive (Figure 6).

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insert Figure 5 and 6

about here

The Product Market Portfolio

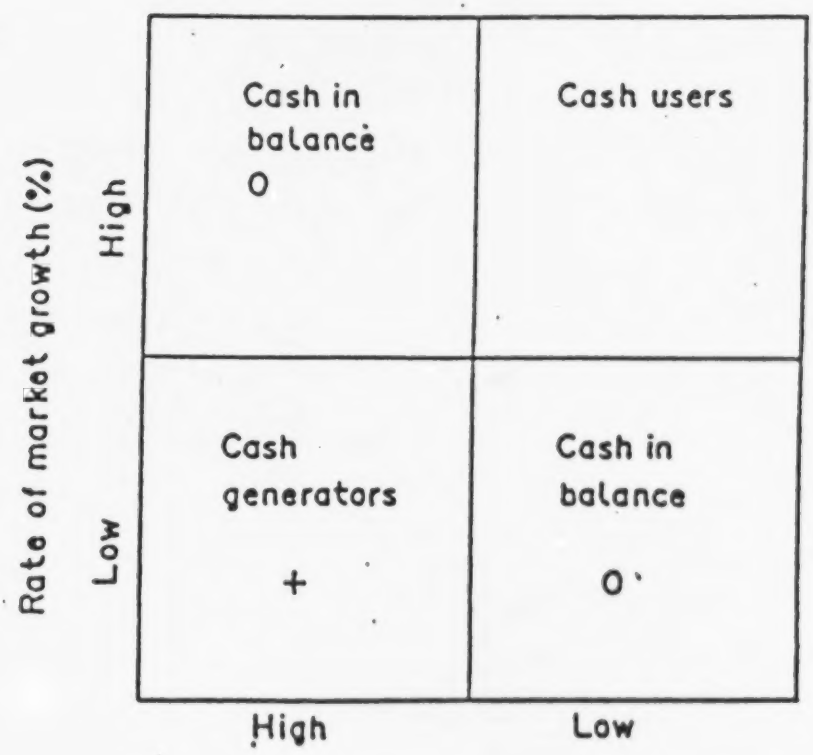

Figure 5. Financial Implications of market Potential

Source: Adapted from McNomee (1985).

Product Categories in the Growth/Share Matrix

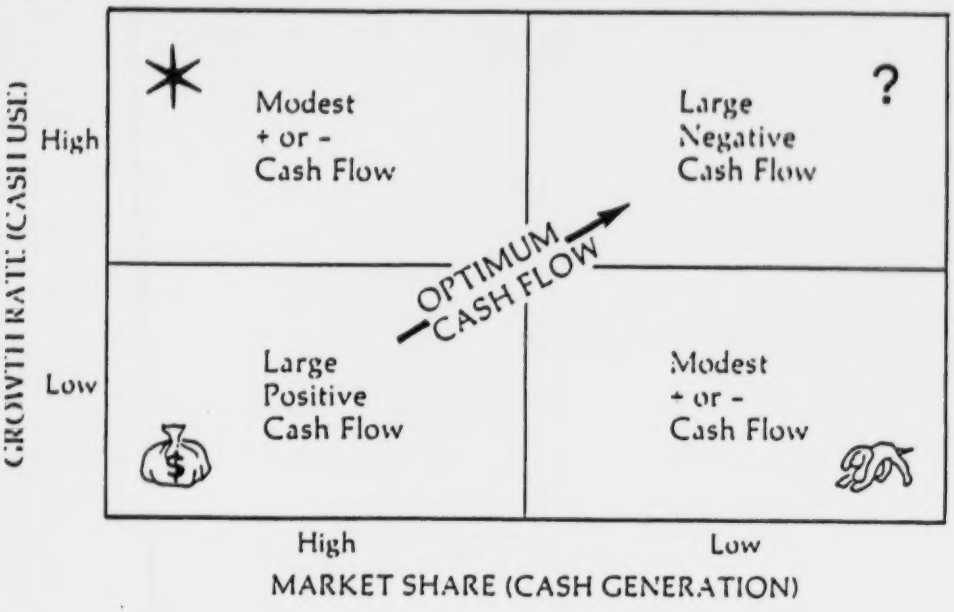

Figure 6. Cash Flows

Source: Adapted from Fry and Killing (1986).

Many different types of matrices have been developed, some simplistic, some much more sophisticated (Gluck, 1985; Pekar, 1982, 1986; Fry and Killing, 1986; McNomee, 1985; Naylor, 1983; Harris, Show, and Sommers, 1983). In the human resources area, portfolio analysis of where individuals stand in terms of career development, has been used by Sweet (1982) as part of the life cycle approach. He found that managers were comfortable with the terminology thus enabling him to keep their attention (J. Sweet, Personal Communication, Winter, 1982). While Sweet utilized a simple star/dog/cow/child matrix, HRD professionals might be able to adopt this methodology to more sophisticated analyses, as using managements' "buzz-words" or terminology, can lend credibility to an argument.

The portfolio matrix appears to work best in stable environments, "when the alternatives are known and relatively constrained and when the future is a confirmation of the past" (Gluck, 1985). Within these constraints, however, there are a number of strengths, as (1) methodology and "supporting logic" are easily grasped, (2) the approach can be applied across several industries or departments within a single organization (Pekar, 1982a) and (3) the HRD professional can include a large number of non-quantifiable but relevant factors in his/her analysis (McNomee, 1985).

Conversely, matrix approaches have been criticized as "too simple to be useful" (Pekar, 1986). In addition, the technique does not require "rigorous research," therefore, meaningful analysis can be limited (Pekar, 1982a).

It would seem, then, that portfolio matrices depicting career development, if carefully constructed, would be most useful in examining where individuals stand, rather than predicting future directions. As the question of timing is not addressed (Fry and Killing, 1986), management must be presented with the analysis and then helped to set strategic objectives based on business as well as personal concerns. As data input, however, the portfolio matrix can be an important part of human resource strategy development.

Cross-Impact Analysis

This data gathering tool consists of a matrix (Figure 7) that details the probabilities of a series of events happening, given that another event has occurred. The methodology "requires a methodical questioning about the potential impact of one item, should it occur, on the others of a set" (Lanford, 1972). A panel of 'experts' sometimes is consulted then, and the individual forecasts combined into the matrix. Depending upon the expert's reputation, or in the case of well reasoned arguments, different weights may be assigned to individual predictions (Beasley and Johnson, 1984).

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insert Figure 7 about here

The key consideration is the manner in which the occurrence of one happening or event could affect the occurrence of another event. Steps in matrix preparation include (Barron and Targett, 1985):

1. the development of an "extensive" listing of all relevant environmental factors--political, economic, technological, competitive, etc.,
2. a subjective estimation of the probability that various developments will occur,
3. matrix construction so that "each element of the matrix is the new probability for the development in that column given that the development of that row has taken place" (pp. 21-22) (Figure 7).
4. Calculate the likelihood of different developments occurring.

Cross matrices do not, of course, produce strategies, just input into the strategic decision making process. The advantage of this system, is that widely-varied, complex, interrelated environmental factors can be analyzed in "a relatively straight

If this development were to occur	Then probability of			
	D1	D2	D3	D4
D1	X	—	—	↑
D2	↑	X	—	↑
D3	—	—	X	—
D4	—	—	—	X

Source: T. J. Gordon, "Cross-Impact Techniques," paper presented at the Environmental Forecasting Conference, the University of Texas at Austin, January 1970.

Development	*Probability*
D1 (One-month reliable weather forecasts)	0.4
D2 (Feasibility of limited weather control)	0.2
D3 (General biochemical immunization)	0.5
D4 (Crop damage from adverse weather eliminated)	0.5

Figure 7. Matrix of Developmental Probabilities

Source: Adapted from Beasley and Johnson (1984).

forward manner." Disadvantages include the expense of forecast preparation and problems in the interpretation of subjective probabilities provided by experts (Barron and Targett, 1985).

There seems no reason why cross-impact methodologies cannot be adapted to the human resources milieu. In concert with the "no change scenario," for example, the HRD professional, could forecast the impact of various levels of inputs (financial and otherwise) into the human resource development function. Another potential area of application is succession planning, where grooming of future managers is essential.

Graphical Methodologies

It could be argued that graphical methods are but portions of other techniques. For example, political maps, as drawn by Coplin and O'Leary obviously are part of the political analysis process. There are information-gathering techniques, however, that focus strongly on visual effect, otherwise data would be meaningless or extremely difficult to comprehend.

No apologies will be made here for perceived overlap. Of paramount importance is the utility of the various techniques in data acquisition and as effective inputs into the strategy design function.

A. Force Field Analysis

In the 1950's Lewin (1951) introduced the Force Field Analysis concept as a method for managing change. It is still widely used, mostly by organizational development practitioners, as an aid to effecting change in people, technology or structure (Huse, 1980).

As suggested in Figure 8, should an organization currently at "a" wish to move to a more desirable state "b", the forces for and against change can be identified and their relative strength estimated; the relative strength of each represented by length of arrow. Of itself, this methodology does not decrease inertia toward strategic change.

It does, however, produce a "picture" that aids in the identification and assessment of the various threats, opportunities and choices open to decision makers (Thomas, 1985).

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insert Figure 8 about here

Should this process be completed in groups, additional benefits include team building and a more general awareness of human resource development needs (Ajimal, 1985). For the HRD professional, then, an analysis of the forces supporting and opposing effective human resources development might be used as part of a political study and/or as inputs to management, explaining the need for strategy modification.

B. Network Construction

In technical terms, it is evident "that time-independent contextual mapping is of greatest importance where exploratory forecasting is employed to prepare a basis of potential system concepts that will be matched against operational objectives" (Lanford, 1972). Thus, networks can be drawn to show trends, necessary activities, or schedules. For the HRD professional's use, it is suggested that informality be the guide. Should a structured approach be appropriate, Critical Path Management (CP.M.) is less difficult to learn than the more commonly-used PERT. These systems are well documented in many basic texts, however, and they will not be described further.

C. Decision Trees

The well known methodology related to the drawing of decision trees (Rowe, Mason and Dickel, 1986) has been adapted in a number of ways. King (1981) has developed strategic issues models that break down high-level issues into different levels of abstraction (Figure 9). Barron and Targett (1985) use "relevance trees" to "put out 'feelers' to see what the future might look like" (p. 25) (Figure 10). Others have made similar adaptations (Ulvila, 1985).

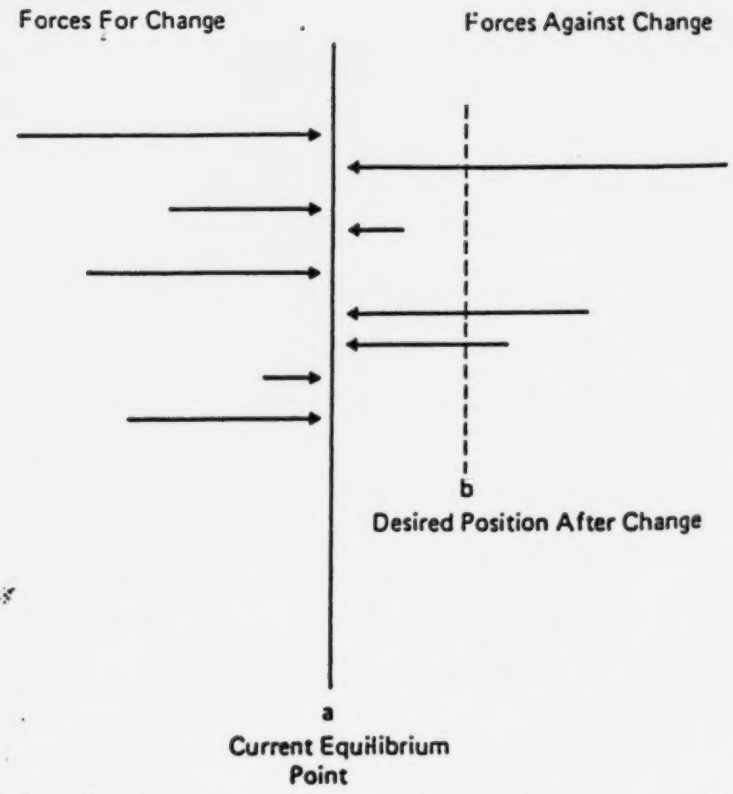

Figure 8. Force Field Diagram

Source: Adapted from Tomas (1985).

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insert Figures 9 and 10

about here

Whether using an adaptation or a conventional method, decision trees can be utilized to predict human resource inputs. The work of Bogue and Buffa (1986) for example, uses decision trees to create strategic scenarios for capacity additions (p. 147) (Figure 11). How easy it would be for the HRD professional to add a human resource dimension, in numbers of personnel required and/or in cost!

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insert Figure 11 about here

D. Graphs

The final graphical data gathering model to be discussed here is based on the Gantt Chart principle. Developed by a major insurance company (Melanson, 1988) the future is depicted over a ten-year period, with human resource development inputs charted for each year (Figure 12). If it is to be assumed that the HRD professional had some input into this process, this technique might prove useful as a method of ordering knowledge, so that long-range strategy can be continually revised.

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insert Figure 12 about here

<u>Uncertainty - Complexity Analysis</u>

As organizations grow in complexity, activities related to the human resource function need to be assessed in a systematic manner. Key system and work

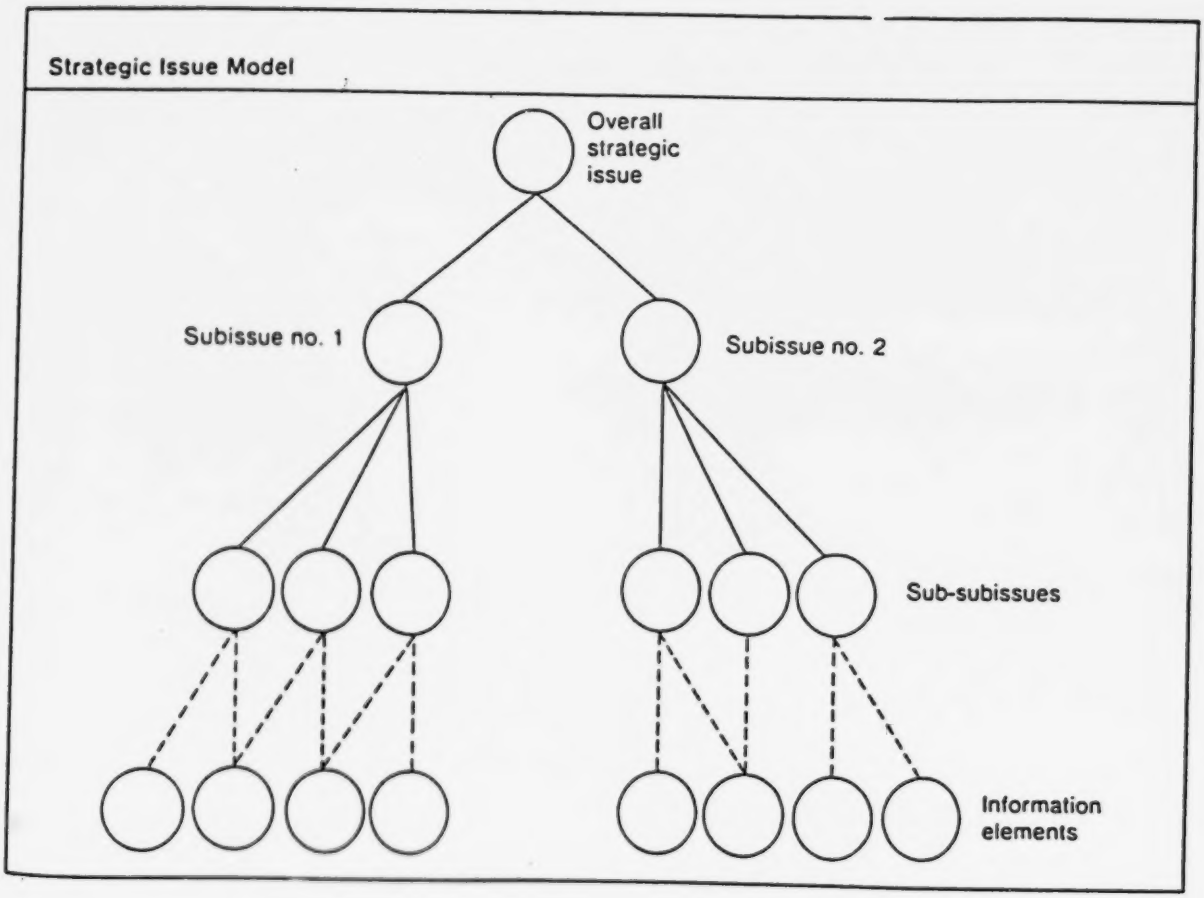

Figure 9. Stategic Issue Model

Source: Adapted from King (1981).

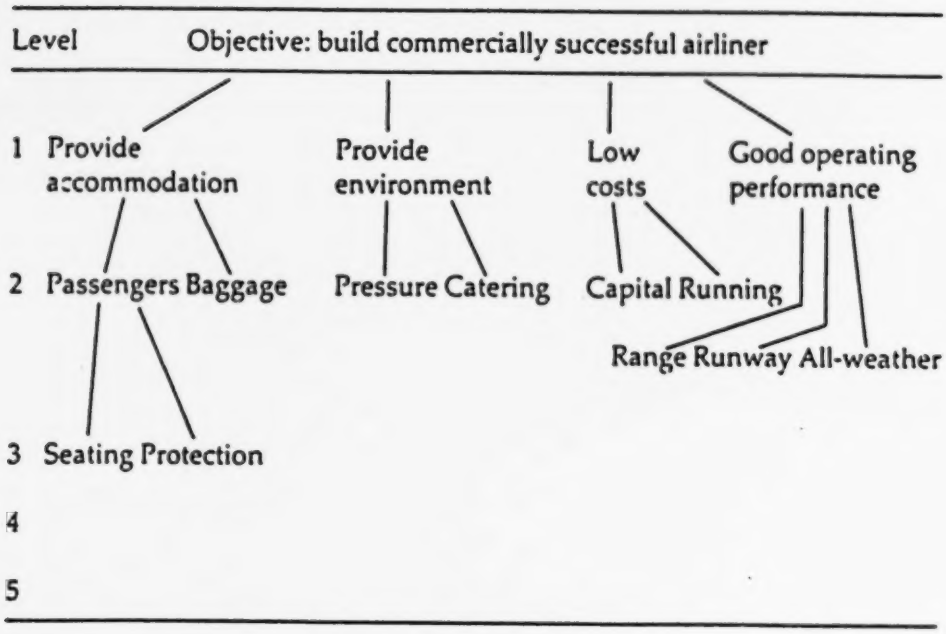

Figure 10. Relevance Tree

Source: Adapted from Barron and Targett (1985).

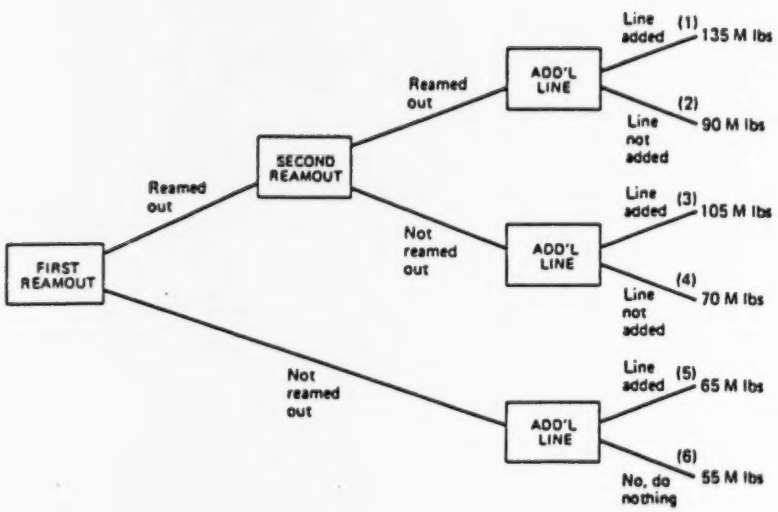

Figure 11. Capacity Analysis Through Decision Trees

Source: Adapted from Bogue and Buffa (1986).

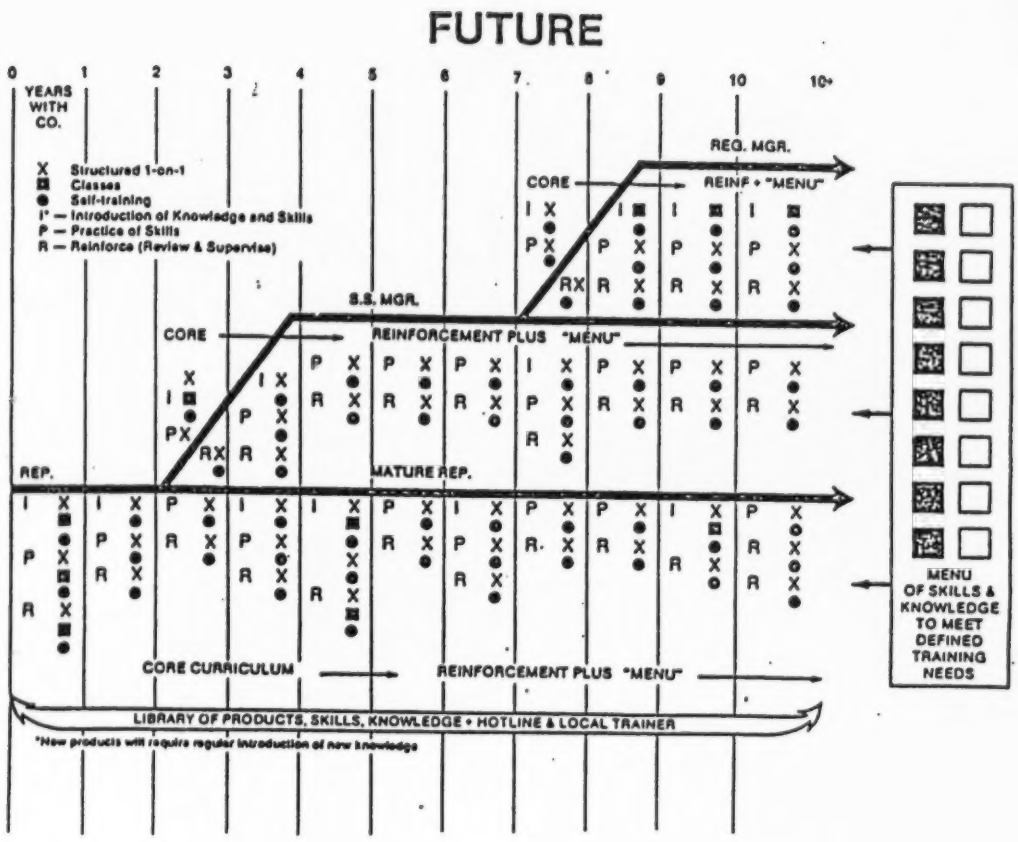

Figure 12. Future

characteristics, as well as personal interrelationships must be identified if job and system designs are to be improved to meet changing human resource needs (Burack and Hasson, 1982).

Uncertainty - complexity analysis (U-C) starts with the identification of an appropriate work unit or task. Subsequently, U-C characteristics are described for internal and external environmental features. Uncertainty concepts may include:

1. the inability to predict future events,
2. problem situations with unknown quantities,
3. elements where there is only partial knowledge or accuracy

(Burack and Hasson, 1982, p. 34).

Similarly, complexity analysis deals with the decision maker's "conceptual" difficulties, including the necessity to cope simultaneously with a number of factors. Burack and Hasson (1982) suggest that the following environmental factors enter the U-C analysis process:

1. **External Environment**

   • ***Uncertainty:*** social, political and economic trends; governmental regulation; supply-demand relationships; energy alternatives; customer demand; population shifts; competitive tactics and the shape and place of technological change,

   • ***Complexity:*** marketing, channels; number of customers, products; number of sales/production/service units and geographical distances/dispersion (p. 34).

2. **Internal Environment**

   • ***Uncertainty:*** available human resource skills relative to those demanded; adaptation of units, work groups and individuals to new or changed conditions; level and quality of information feedback and information capabilities for decision making,

> • *Complexity:* number of possible process or activity paths; number of informational/operational alternatives; production and cost factors; number of personnel, departments, etc. and size of area occupied. (p. 34)

When environments are analyzed in this manner, information sources can be identified, patterns of coordination and liaison may be isolated and potential areas of conflict defined. This type of information is of value to the HRD professional, in that knowledge of complexity and uncertainty can be used to ward off those who prepare simplistic solutions to human resource problems.

The strengths of U-C analysis lie in its "comparative simplicity" and its adaptability to an audit function. As an analysis tool, however, the underlying precepts are "somewhat imprecise" (Burack and Hasson, 1982).

Critical Success Factors

This technique operates in a similar fashion to U-C analysis, in that 'key variables' that "significantly impact profitability" are isolated. Leidecker and Bruno (1984) suggest that during the strategy development process, critical success factor analysis can best serve as input during environmental analysis, resource analysis and strategy evaluation (p. 25). In addition, the approach has been adapted to aid in the definition of senior management's information needs (Rockart, 1979). Either way, the identification of critical success factors can provide the HRD professional with important information concerning possible emphases and strategic directions.

Qualitative Methodologies and the Decision Making Function

At this point, an attempt will be made to evaluate the various data gathering methodologies in relation to the strategic decision making process. Such an analysis is an important first step in the application of qualitative input techniques. A thorough investigation of the current decision making system, therefore, may determine the

relative utility of any given method (Barron and Targett, 1985). Indeed, decision making style may influence perceptions as to what type of information is valid, and what kind is not.

There is a problem, however, in that the cognitive processes surrounding the strategic planning function are extremely complex (Steiner, Miner and Gray, 1984). In addition, each process may be "unique," because of the many interrelated factors involved: values, motivation, individual capability, leadership skills, peer and subordinate relationships, organizational politics (p. 173). In fact, Mintzberg, Raisinghami and Theoret (1976) have suggested that:

> . . . . a strategic decision process is characterized by novelty, complexity, and open endedness, by the fact that the organization usually begins with little understanding of the decision situation it faces or the route to its solution, and only a vague idea of what the solution might be and how it will be evaluated when it is developed. Only by groping through a recursive, discontinuous process involving many difficult steps and a host of dynamic factors over a considerable period of time is a final choice made. This is not the decision making under *uncertainty* f the textbook, where alternatives are given even if their consequences are not, but decision making under *ambiguity*, where almost nothing is given or easily determined. (pp. 250-251)

Faced with this ambiguity, many authors have tried to order the decision making elements. Harrison (1981), for example, proposed a framework consisting of six classifications: internal environment, external environment, group behavior, individual behavior, economic/technical analysis and value/ethical issues (Figure 13).

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insert Figure 13 about here

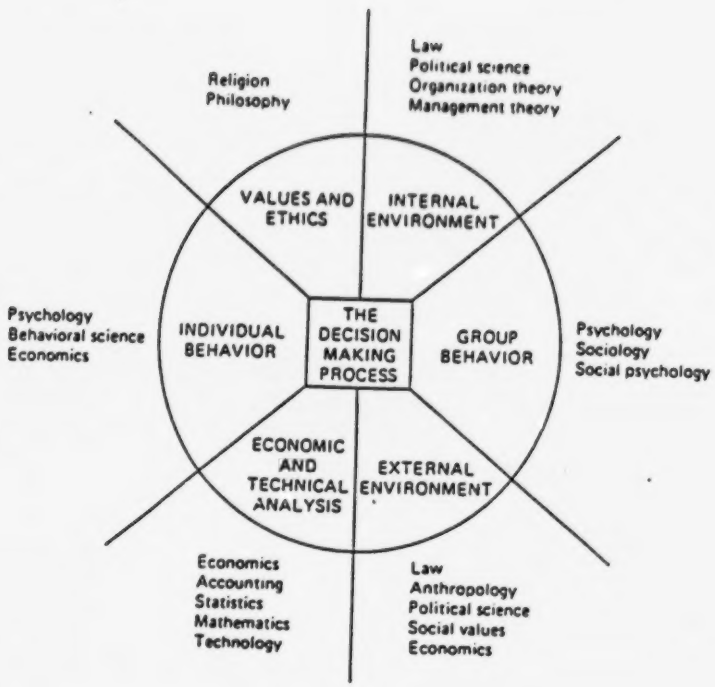

Figure 13. Decision Making Framework

Source: Harrison (1982) adapted by Steiner, Miner and Gray (1984).

It is felt, however, that to be of practical use, Harrison's work must be viewed within the context of the evolution of planning thought. Gluck, Kaufman and Walleck (1980), for example, have postulated four evolutionary stages in strategic planning:

1. Budget-driven, basic financial planning,
2. Future prediction, forecast-based planning,
3. Externally-driven, market response planning,
4. Future creation, strategic resource management toward competitive advantage (Hussey, 1984).

This concept was mentioned previously (Allio, 1984) in our definition of strategic planning.

Bearing the evolutionary process in mind, and further adapting Harrison's work (Figure 14), each of the previously discussed qualitative methodologies can be assigned to each element of the decision-making process. In addition, a subjective analysis can be made concerning the relative utility of each methodology as a tool for gathering data within each sector.

This utility, has been denoted by the letters: S, M., W, - strong, moderate and weak. "Strong" suggests that a technique has high utility and probably could be used in most work environments to gather data. "Moderate" indicates that a given technique would have some utility in most work situations, but there may be reservations about general applicability and weak is the term for unacceptable usage in a particular area.

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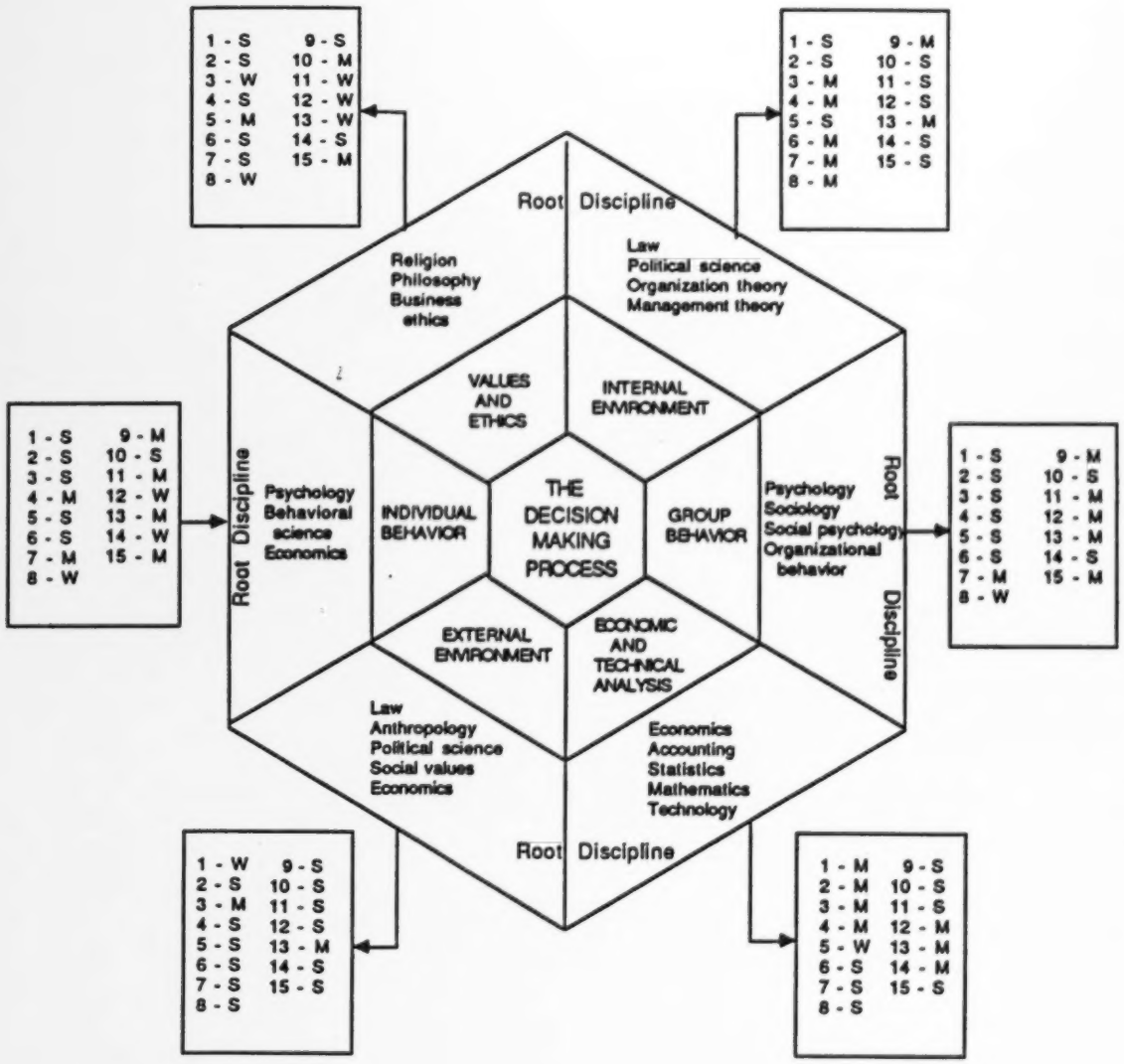
insert Figure 14 about here



Legend

1 Cultural Audit
2 Judgemental
3 a. Life Cycles
4 b. Delphi
5 Political Forecasting
6 Failure Analysis/History
7 Scenarios
8 Portfolio Analysis
9 Cross Impact Analysis Graphical Methodologies
10 a. Force-Field Analysis
11 b. Network Construction
12 c. Decision Trees
13 d. Graphs
14 Uncertainty - Complexity Analysis
15 Critical Success Factors

Figure 14. Application of Qualtitative Data Gathering Methodologies to the Strategic Decision Making Process

It is to be noted that Figure 14 is comprised solely of one individual's "judgment" concerning relative utility. In order to validate or discount these data, an appropriately chosen sample of HRD professionals should be contacted and asked to repeat this "judgmental" process.

The problem with this type of analysis, is that it does not address the cognitive processes in terms of decision styles. While it is apparent that each organization is unique, and that individual decision makers tend to react to a plethora of ever-changing needs, Rowe, Mason and Dickel (1986), have adapted the work of Zalezwick (1977) in which four decision-making styles are outlined: directive, analytic, conceptual and behavioral. Figure 15 delineates the characteristics of each style. As well, the 15 qualitative data-gathering techniques again are "judged" in terms of utility as inputs into a decision system characterized by each of the four styles. As to validity, the same statement applies--more research will have to be conducted with groups of "experts." Indeed, a detailed analysis of both Figures 14 and 15 is best postponed until a more rigorous "judgmental" process is completed.

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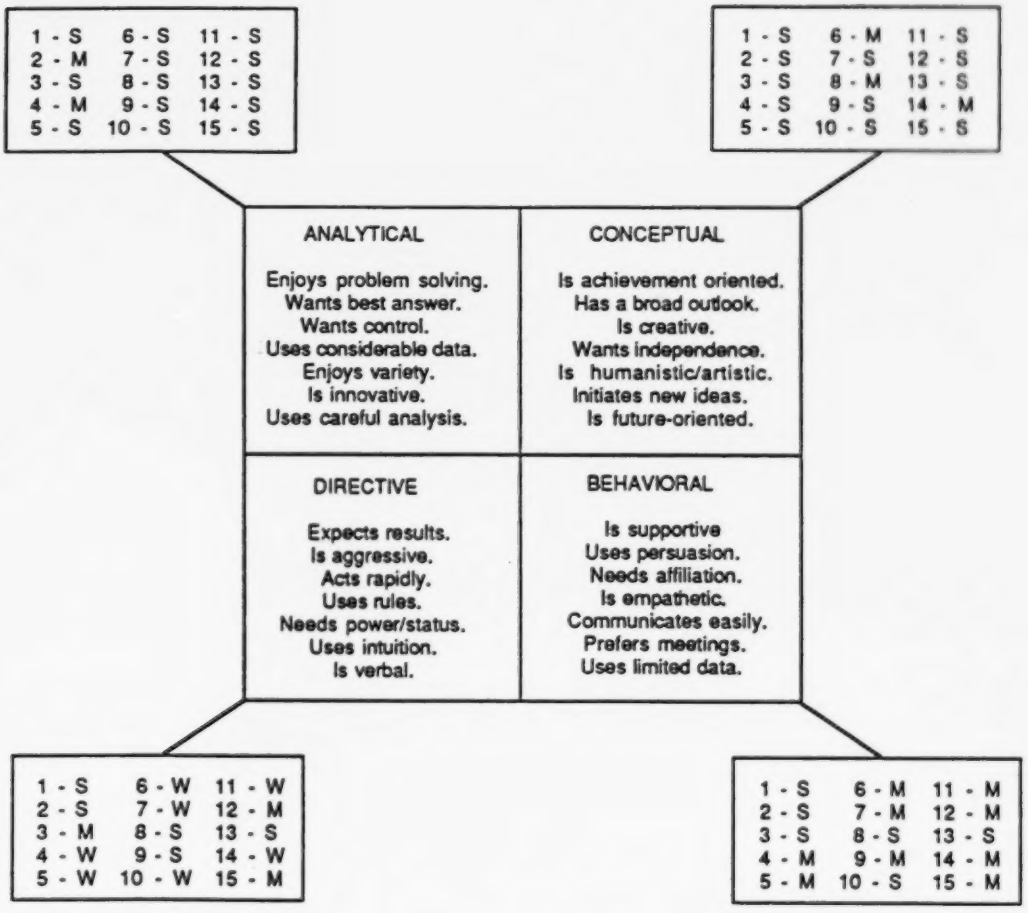
insert Figure 15 about here

Conclusion

More research must be completed before it can be stated with any confidence that a given data gathering technique is best suited for a particular task, or as input into a particular decision making system. One commonalty seems to be the effect of culture on both the data gathering and the decision making processes. In essence, all activities appear to be filtered through a cultural screen so that given similar external opportunities and threats, two organizations might develop quite different strategic plans (Figure 16). These differences might be caused by management decision styles, by


1 - S 6 - S 11 - S
2 - M 7 - S 12 - S
3 - S 8 - S 13 - S
4 - M 9 - S 14 - S
5 - S 10 - S 15 - S
1 - S 6 - M 11 - S
2 - S 7 - S 12 - S
3 - S 8 - M 13 - S
4 - S 9 - S 14 - M
5 - S 10 - S 15 - S
ANALYTICAL
Enjoys problem solving.
Wants best answer.
Wants control.
Uses considerable data.
Enjoys variety.
Is innovative.
Uses careful analysis.
CONCEPTUAL
Is achievement oriented.
Has a broad outlook.
Is creative.
Wants independence.
Is humanistic/artistic.
Initiates new ideas.
Is future-oriented.
DIRECTIVE
Expects results.
Is aggressive.
Acts rapidly.
Uses rules.
Needs power/status.
Uses intuition.
Is verbal.
BEHAVIORAL
Is supportive
Uses persuasion.
Needs affiliation.
Is empathetic.
Communicates easily.
Prefers meetings.
Uses limited data.
1 - S 6 - W 11 - W
2 - S 7 - W 12 - M
3 - M 8 - S 13 - S
4 - W 9 - S 14 - W
5 - W 10 - W 15 - M
1 - S 6 - M 11 - M
2 - S 7 - M 12 - M
3 - S 8 - S 13 - S
4 - M 9 - M 14 - M
5 - M 10 - S 15 - M

Legend

1 Cultural Audit
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13 d. Graphs
14 Uncertainty - Complexity Analysis
15 Critical Success Factors

Figure 15. Decision Making Styles and The Relative Utility of Qualitative Data Gathering Techniques

the needs of individual decision makers, by internal political considerations and by a host of other group dynamics. In other words, the culture of a firm affects the strategic planning process in both tangible and intangible ways.

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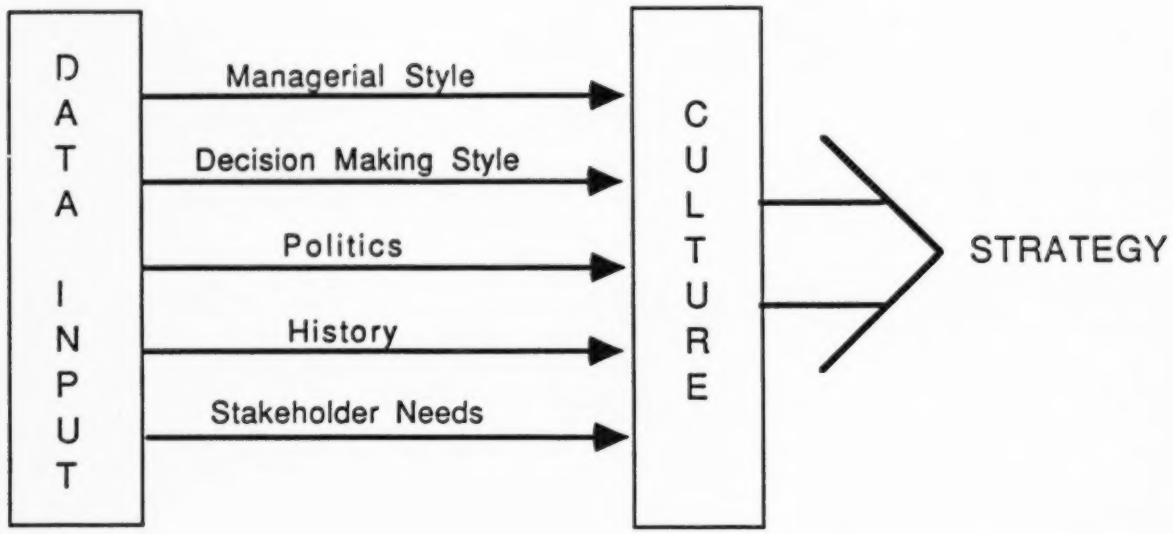

Figure 16. Culture Affects Strategy

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